

1 CLAIMS

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3 1. A forensic viewer, comprising a lens, said lens comprising a variable focal length
 4 lens configured to focus light in a focal surface, from an object or surface being
 5 imaged, as a focused light image of variable image size, said lens having a first
 6 operator for varying focal length and image size, said lens comprising a plurality of
 7 optical elements, said elements having the characteristics of transmitting ultraviolet
 8 light, an imaging device for converting an ultraviolet image to a visible image, said
 9 imaging device having an input and an output, and support structure for
 10 supporting said imaging device at a position relative to said lens where said lens
 11 focuses said focused light image at the input of said imaging device;

12

13 2. A forensic viewer as in claim 1, wherein said imaging device comprises an
 14 electrically powered image intensifier having an output and an input optically
 15 coupled to the lens to receive the focused light image from the lens and provide at
 16 the output of said image intensifier an intensified light image.

17

18 3. A forensic viewer, as in claim 2, further comprising:

19 (a) mounting structure disposed on said lens;

20 (b) a chassis configured to support said intensifier and to matingly engage said lens
 21 by engaging said mounting structure, said lens being engaged by said mounting
 22 structure in a use position;

23 (c) a power source; and

24 (d) an electrical switch having an open and a closed state, connected to couple
 25 electrical power from said power source to said image intensifier in said closed state
 26 and to decouple electrical power from said power source to said image intensifier in
 27 said open state, said electrical switch comprising an operator for configuring said
 28 electrical switch in the open state in an open operator position or in a closed state in

- 1 a closed operator position, and said operator being urged into said closed operator
2 position by said lens mounted on said chassis in said use position.
3
- 4 4. An image intensifying forensic viewer as in claim 3, wherein said lens is
5 moveable, engaged by said mounting structure, between a use position and a release
6 position to release said mounting structure and said lens in the release position.
7
- 8 5. A forensic viewer as in claim 1, wherein said imaging device is an electrically
9 powered image intensifier, said image intensifier being sensitive to ultraviolet light.
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- 11 6. A viewer as in claim 1, further comprising a UV light source configured to
12 illuminate said object or surface.
13
- 14 7. A viewer as in claim 1, further comprising a tripod mounting, secured to said
15 support structure.
16
- 17 8. A viewer as in claim 1, wherein said imaging device is a layer of material which
18 converts ultraviolet light to visible light.
19
- 20 9. An image intensifying forensic viewer as in claim 3, wherein said lens has a
21 bayonet mounting structure configured to nest into and be rotated into engagement
22 with mating bayonet mounting structure on said chassis.
23
- 24 10. An image intensifying forensic viewer as in claim 3, wherein said lens transmits
25 ultraviolet light, said electronically powered device image intensifier is sensitive to
26 ultraviolet light and said lens is a focusable lens.
27
- 28 11. An image intensifying forensic viewer as in claim 2, wherein said lens has snap

1 mounting structure configured to snap into engagement with mating snap
2 mounting structure on said chassis.

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4 12. An image intensifying forensic viewer as in claim 3, further comprising viewing
5 optics for presenting the output of said image intensifier to the eye of a viewer.

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7 13. An image intensifying forensic viewer as in claim 1, further comprising viewing
8 optics for presenting the output of said image intensifier to the eye of a viewer.

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10 14. An image intensifying forensic viewer as in claim 13, further comprising
11 viewing optics for presenting the output of said image intensifier to photographic
12 film in a camera.

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14 15. An image intensifying forensic viewer as in claim 3, wherein said operator is
15 spring biased in said open operator position.

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17 16. A forensic viewer according to claim 1 further comprising an ultraviolet filter
18 positioned in front of said lens.

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20 17. A forensic viewer according to claim 3 further comprising an ultraviolet filter
21 positioned in front of said lens.

22

23 18. A viewer according to claim 3 comprising an eyepiece coupled to said
24 intensifier.

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26 19. An ultraviolet forensic viewer according to claim 17, comprising a camera
27 containing film coupled to receive said focused light image from said film.

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1 20. A forensic viewer as in claim 1, wherein said support structure comprises a
2 housing with a round top and narrowed bottom and further comprising a hand
3 strap coupled at two points to the side of said housing.

4

5 21. A forensic viewer as in claim 20, wherein said housing round top is made of a
6 soft grippable material.

7

8 22. A forensic viewer as in claim 21, wherein said housing is narrower at the bottom
9 of the housing as compared to the top of the housing.

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11 23. A forensic viewer according to claim 1 further comprising an ultraviolet light
12 source mounted on said support structure.

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14 24. A forensic viewer according to claim 3 further comprising an ultraviolet light
15 source mounted on said support structure.

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17 25. A forensic viewer as in claim 1, wherein said focal length of said lens is varied by
18 an automated system.

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20 26. A forensic viewer as in claim 25, wherein said automated system is an electronic
21 zoom without moving parts.

22

23 27. An ultraviolet light imager comprising:

24 a) a camera having:

25

26 i) a variable focal length camera lens to input ultraviolet light images to the camera,
27 the camera being loadable with a film to capture images received from the camera
28 lens, the spacing of the camera lens from the film, when loaded, being adjustable to

- 1 focus an input ultraviolet image on the film; and
2
- 3 ii) a camera mirror having an ultraviolet--reflective surface to reflect image light
4 received from the camera lens to provide a reflected ultraviolet image for use in
5 focusing the camera lens; and
6
- 7 b) an image intensifier optically coupled to the camera to receive the reflected
8 ultraviolet image from the camera mirror and provide a viewable output;
9
- 10 wherein the reflected ultraviolet image is focused to the viewable output of the
11 intensifier.
12
- 13 28. An ultraviolet light imager according to claim 27 wherein the camera lens is an
14 ultraviolet--transmissive, optionally quartz, lens.
15
- 16 29. An ultravioletlight imager as in claim 28, further comprising a tripod mounting
17 for supporting said imager.
18
- 19 30. An ultraviolet light imager according to claim 27 comprising a second mirror
20 having an ultraviolet--reflective surface, optionally a surface reflecting ultraviolet
21 light at wavelengths from about 200 to about 360 nm, the second mirror being
22 capable of reflecting to the intensifier images received from the camera mirror.
23
- 24 31. An ultraviolet light imager according to claim 27 comprising an eyepiece
25 coupled to the intensifier.
26
- 27 32. An ultraviolet light imager according to claim 31 comprising a charge-coupled
28 device coupled to the eyepiece.

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2 33. An ultraviolet light imager according to claim 32 comprising a video camera
3 coupled to the eyepiece.

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5 34. An ultraviolet light imager according to claim 27 wherein the intensifier is a UV--
6 to--green light converter.

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8 35. An ultraviolet light imager according to claim 27 comprising an ultraviolet--
9 sensitive film loaded in the camera.

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11 36. An ultraviolet light imager comprising:

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13 a) a camera having:

14

15 i) a variable focal length camera lens to input ultraviolet light images to the camera,
16 the camera lens being an ultraviolet--transmissive, optionally quartz, lens;

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18 ii) a film to capture images received from the camera lens, the spacing of the camera
19 lens from the film being adjustable to focus an ultraviolet image on the film; and

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21 iii) a camera mirror having an ultraviolet--reflective surface to reflect a portion of the
22 image light received from the camera lens to provide a reflected ultraviolet image
23 for use in focusing the camera lens;

24

25 b) an image intensifier optically coupled to the camera to receive the reflected
26 ultraviolet image from the camera mirror and provide a viewable output;

27

28 c) a viewing lens system to receive an ultraviolet image reflected by the camera

1 mirror and project said ultraviolet image to the image intensifier, said lens system
2 replacing the conventional prism and focusing plate of a single lens reflex camera;
3 and

4

5 d) a second mirror having an ultraviolet--reflective surface, optionally a surface
6 reflecting ultraviolet light at wavelengths from about 200 to about 360 nm, the
7 second mirror being capable of reflecting to the intensifier images received from the
8 camera mirror;

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10 wherein the reflected ultraviolet image is focused to the viewable output of the
11 intensifier.

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13 37. An invisible wavelength light imager comprising:

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15 a) a camera having:

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17 i) a variable focal length camera lens to input invisible wavelength light images to
18 the camera;

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20 ii) a film to capture images received from the camera lens, the spacing of the camera
21 lens from the film being adjustable to focus an invisible wavelength image on the
22 film; and

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24 iii) a camera mirror having an invisible wavelength--reflective surface to reflect a
25 portion of the image light received from the camera lens to provide a reflected
26 invisible wavelength image for use in focusing the camera lens; and

27

28 b) an image intensifier optically coupled to the camera to receive the reflected

1 invisible wavelength image from the camera mirror and provide a viewable output;
2
3 wherein the reflected invisible wavelength image is focused to the viewable output
4 of the intensifier.
5

6 38. A method of examining a crime scene, comprising:
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8 a) illuminating the crime scene with ultraviolet light;
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10 b) using a zoom lens with an adjustable focal length to project an ultraviolet image
11 of a subject on an image intensifier for intensification; and
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13 c) adjusting the focal length of said zoom lens; a method as in claim 19, further
14 comprising:
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16 d) using the intensified ultraviolet image to focus the camera on the subject; and
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18 e) opening the camera shutter to capture a focused ultraviolet image of the subject
19 on film.